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Randomized control trial of Teaching Recovery Techniques in rural occupied Palestine:

Effect on adolescent dissociation

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Abstract

The current study assessed the effect of a cognitive behavioral group intervention, Teaching Recovery Techniques (TRT), for adolescents with high levels of posttraumatic stress ($n = 154$), from villages in occupied Palestine. A randomized control trial involved standardized measures to assess war stressors, posttraumatic stress, depression, and dissociation. Program fidelity was measured by presenter and observer ratings and program delivery cost was calculated per adolescent. High levels of traumatic exposure, dissociation, and posttraumatic stress were found. In comparison to a Wait List group ($n = 75$), TRT adolescents reported significantly fewer posttraumatic stress symptoms post-intervention. Depression and dissociation remained stable for TRT adolescents, but worsened for Wait List. Given the high returns and low costs, this cost-benefit analysis makes a clear case for TRT to be delivered throughout the West Bank. Longitudinal evaluation is needed to assess adolescent traumatization and the impact of TRT within a context of ongoing violence.

Keywords: traumatization, cognitive behavioral therapy, posttraumatic stress, depression

Randomized control trial of Teaching Recovery Techniques in occupied Palestine: Effect on dissociation

Previous studies have found that adolescents in occupied Palestine experience a wide range of traumatic events. These include sniper fire, bomb blasts, military detention, beatings, and torture (Barron, Abdallah, & Smith, 2013). High levels of domestic violence have also been identified (Al-Krenawi, Graham, & Sehweil, 2007). As the occupation has been in place since 1948, many parents of adolescents have been traumatized, leading to dysfunctional parenting and anxious attachments (Punamaki, Qouta, & Sarraj, 1997). On a day to day basis, adolescents can experience humiliation and violence as they walk to school and cross checkpoints. In short, traumatic experiences for adolescents in the West Bank have been historic, intergenerational, cumulative, and collective for families and communities (Barron & Abdallah, 2015). Trauma recovery studies, to date, have focused on cities rather than rural villages. The latter, however, may experience similar levels of violence and symptomology yet have poorer access to services and treatment. The current study seeks to assess the levels of traumatic exposure and resultant symptoms for children in rural locations as well as introduce and evaluate a trauma-specific treatment.

A wide range of interventions have been utilized in occupied Palestine to address adolescent trauma. These have included art, music and play therapy, counseling, as well as the provision of summer camps with a range of educational, cultural, and emotional wellbeing goals. Nearly all these strategies have been adopted without adequate evaluation and or cost-benefit analysis (Oudeh, Nizam, Barron, Abdallah, & Willets, 2015). In contrast to these initiatives, the Teaching Recovery Techniques (TRT) manual is a Cognitive Behavioral Therapy (CBT) trauma-focused skill-based approach that has an evidence base. The TRT group-based program has been

successfully implemented for children and adolescents who have experienced single event disasters such as earthquakes (Giannopoulos, Dikaiakou, & Yule, 2006) and Tsunamis (Pityaratstian, et al., 2014); domestic violence (Barron & Mitchell, 2015); and refugees from war-torn contexts (Ehnholt, Smith, & Yule, 2005). Studies in occupied Palestine suggest TRT is a promising program for reducing adolescent Posttraumatic Stress Disorder symptoms. Barron et al. (2013), utilizing a randomized control trial with 133 adolescents from Nablus city, found a large effect size for reductions in posttraumatic stress. Significant reductions were also found for depression. The authors concluded the latter was likely to be due to adolescents feeling more hopeful as a result of reduced posttraumatic stress. Quota, Palossari, Diab and Punamaki (2012), used a cluster randomized control trial to evaluate an extended 16-session version of TRT and found small reductions in posttraumatic stress but no change in depression. The findings of this study, however, need to be set within the context of a recent bombardment of Gaza. Children and adolescent participants continued to feel unsafe because of imminent threat of attack. Furthermore, both studies were conducted in urban rather than rural settings. Consequently, there is insufficient evidence to recommend implementation of the TRT program for adolescents across occupied Palestine. To further explore TRT effectiveness, this study utilizes a randomized control trial to discover the impact of TRT with adolescents from East Jerusalem area villages along the separation wall, a barrier constructed to limit the movement of Palestinians across the West Bank and into Israel.

In addition to exploring the effect of TRT on post-traumatic stress, the relationship between dissociation and TRT has been studied. The Diagnostic and Statistical Manual of Mental Disorders – fifth edition (DSM-5) defines dissociation as a “disruption of and/or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception,

body representation, motor control, and behavior” (American Psychological Association, 2013, p.291). Only one study to date, Quota, Palossari, Diab and Punamaki (2012), assessed peritraumatic dissociation with children and adolescents. Peritraumatic dissociation may be an immediate response to traumatic events. The authors used a limited 8-item questionnaire at pre-intervention only. The Peritraumatic Dissociative Experiences Questionnaire (PDEQ: Marmar, Weiss, Metzler, & Delucchi, 1996) was used to assess whether peritraumatic dissociation was a mediating factor in the effectiveness of the TRT program for 10-13 year olds in Gaza city ($n = 482$). The authors found only 9.6% of girls reported high levels of peritraumatic dissociation. Further analysis, however, indicated that peritraumatic dissociation was associated with reduced program effectiveness with posttraumatic stress. Another study that explored peritraumatic dissociation and its influence on mental health in the Gaza strip was Punamaki, Komproe, Quota, Elmasri, and de Jong (2005). This study, however, involved adults only ($n = 585$). Again, peritraumatic dissociation, as an acute response to war trauma events, was found to be a vulnerability factor for participants’ long term mental health. In contrast to assessing dissociation at the time of the event, the current study uses a more comprehensive measure to assess levels of dissociation in the adolescent population as well as at post-treatment outcome for TRT.

Kisiel and Lyons (2001) argued that assessment of dissociation is an important part of identifying trauma treatment needs. Perhaps because some argue that pathological dissociation only exists in adulthood (Pynoos, Steinberg, & Wraith, 1995), there has been little assessment of dissociation in adolescence. Others, however, have defined dissociation in adolescence as a natural response to overwhelming terror which becomes triggered by sensory fragments of the original traumatic event (Nilsson, 2007). Symptoms include depersonalization, de-realization, and dissociative amnesia that can lead to long-term mental health consequences. Only a small

number of standardized measures have been developed, for example the Adolescent Dissociative Experiences Scale (ADES: Armstrong, Putnam, Carlson, Libero, & Smith, 1997), the measure used in this study, and the Child Dissociative Checklist (CDC: Putman, Helmers, Horowitz, & Trickett, 1993). The latter utilizes adult observation rather than child self-report. None of these measures, however, have been translated into Arabic.

Finally, no TRT study has explored cost in terms of sustainability of delivery in a resource-poor context of violent military occupation such as occupied Palestine. Despite the significance of cost for policy makers, analysis of delivery costs tend to be omitted from trauma recovery program evaluation. Other fields such as drug prevention, in contrast, have been conducting cost analysis for some time (Miller & Hendrie, 2008). By identifying the costs of programs, policy makers and funders are able to get a measure of the amount of investment required to achieve program outcomes. Identified costs also provide a benchmark to compare the value of programs. Assessing costs without identifying program outcomes or over-prioritizing costs can, however, lead to a false economy with the adoption of cheap but ineffective programs (Barron & Topping, 2012). As there has been no reporting of the costs of the TRT program, the current study has developed a simple framework to communicate costs and results to policy makers and funding organizations. Such information is of particular value in contexts of limited financial, material, and staffing resources.

Addressing the identified gaps in the research, the current randomized control trial explores: the nature and extent of war stressors for adolescents in West Bank villages; the levels of adolescent posttraumatic stress, depression and dissociation; and the effectiveness of the TRT program in reducing these symptoms. Finally, this study provides a measure of cost for future

TRT implementation.

Methods

Purpose of the current study

The hypothesis for the study was that TRT would reduce PTSD, dissociation, and depression in rural adolescents. Future costs of TRT were calculated for Palestinian mental health non-governmental organizations, the Palestinian Authority Ministry of Education, and international funders considering implementing TRT.

Research design

The evaluation involved a randomized control trial of TRT versus a Wait List condition (see Figure 1). Following screening of adolescents for PTSD, a range of pre-post standardized measures was administered for the assessment of post-traumatic stress, depression, and dissociation. Self-reports and observer-reports were used for assessing presenter adherence to program protocols and a measure of cost was developed to anticipate future funding.

Participants

Sample size was determined by power calculations based on previous estimates of effect sizes for TRT (Barron et al., 2013; Quota et al., 2012). A sample size of 75 per group gives 85% power ($p < .05$) to detect an effect size of 0.5. School counselors and participants were randomly selected from 10 randomly selected high schools (70 in the geographical area) situated in 10 villages (Jabaa, Hezma, Anata, Bo Dees, Bethany, Bir Nabala, Qatana, Shuafat, Alram, and Biet Anan) near East Jerusalem along the separation wall (coin tosses). This separation barrier was erected by the State of Israel to restrict the movement of people between the West Bank and Israel. Villages were selected because of the high levels of military violence along the wall. The study was conducted at the beginning of 2015, during a period of continued Israeli settlement

advances and tensions in the region. Inclusion criterion was based on students fulfilling criteria indicative of PTSD on the CRIES-8, that is, a score of 17 or over on intrusion and avoidance subscales. CRIES-8 was selected because of its effectiveness in screening in a previous TRT study (Giannopoulou et al., 2006). Ten counselors, each screened at least 30 adolescents from one to two classes (selected by coin tossing), in the school they work with, for PTSD. Three hundred and thirty four adolescents aged 11 to 15 years ($m = 13.57$; $SD = .82$) were screened in total. Forty eight adolescents declined to participate. The authors speculate that this was because of myths about mental health, stigmatization, and a predetermined view of God, that all is Allah's will. From this corpus sample, 154 adolescents met the criteria for inclusion. Equivalent numbers of students were randomly allocated to intervention, $n = 79$ ($m = 13.59$; $SD = .79$) and Wait List, $n = 75$ ($m = 13.41$; $SD = .84$) conditions. No counselors declined to participate, most likely because the Ministry of Education, following randomized selection, made contact with the counselors affirming their support.

TRT Program

The TRT program was developed by the Children and War Foundation, Bergen and has been successfully used with children in disaster and war contexts (Ehnholt, Smith, & Yule, 2005). It has been found to be culturally acceptable to both adolescents and school counselors in Palestine (Barron, Abdallah, & Smith, 2013). The group-delivered program, based on cognitive-behavioral theory, focuses specifically on children's symptoms of post-traumatic stress disorder. The five sessions help students to understand the causes of trauma and recognize signs and symptoms. Adolescents are taught a range of coping skills to stop flashbacks and other intrusive images, sounds, or smells. Student hyper-arousal is addressed through stabilization and relaxation techniques and phobic avoidance behavior is gradually desensitized through use of

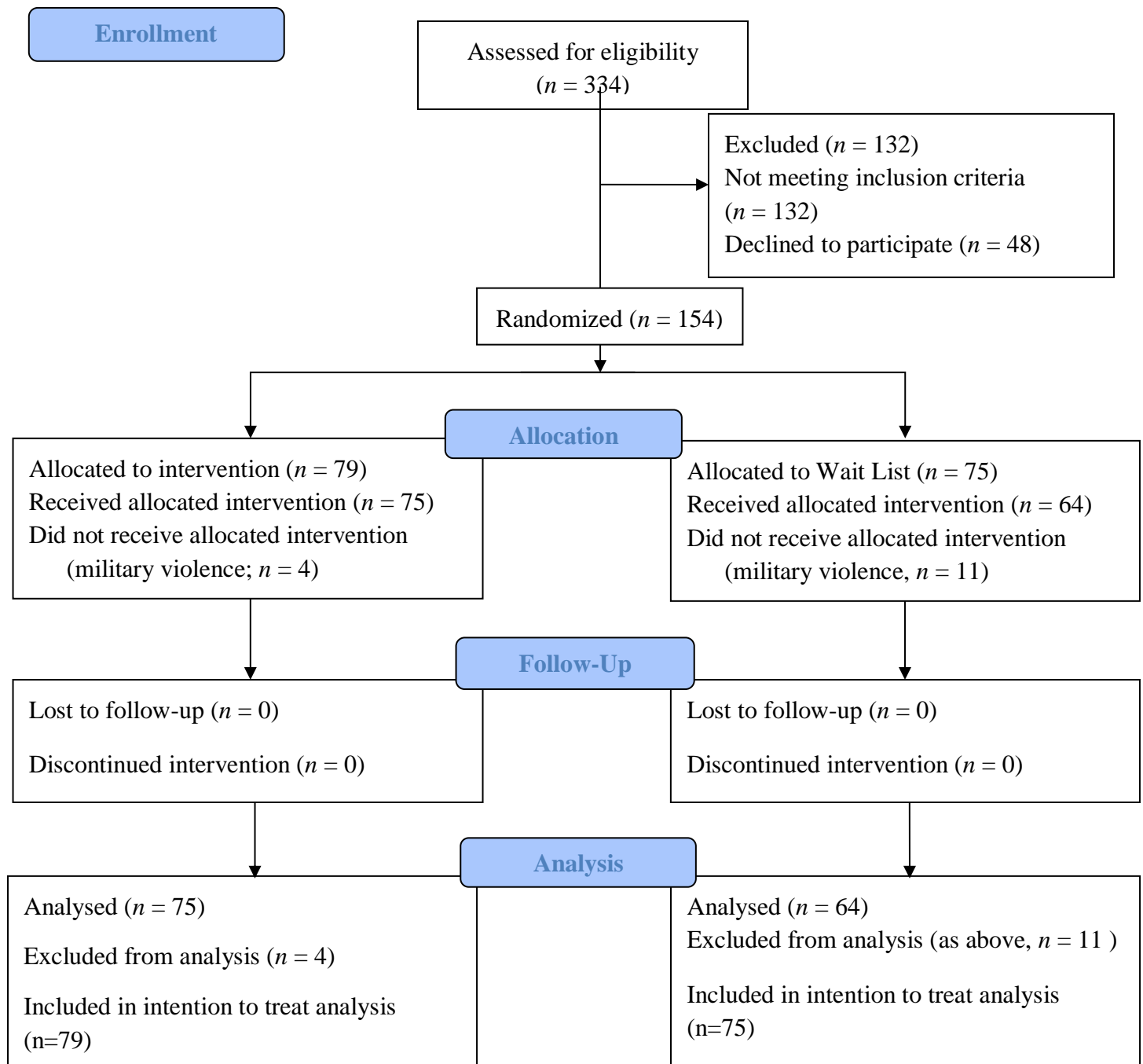
relaxation with anxiety and anger hierarchies. It is recommended the program is delivered by counselors in pairs, a presenter and a counselor who supports activities, to groups of 10 adolescents. Both provided an assessment of program fidelity at the end of each session. Session by session participant attendance was recorded. An Arabic translation of the TRT program was used (Smith, Dyregrov, & Yule, 2008).

Wait List condition

Participants in the Wait List received their usual social education curriculum involving art, civic education, geography, history, and National education, while the intervention group experienced TRT. Both groups received no other treatment. On completion of post-test measures, Wait List adolescents received the TRT program.

Training and peer supervision

Training in TRT for counselors was delivered over three consecutive days by an experienced trainer from the Children and War Foundation (Unni Heltne). The Palestinian researcher provided culturally sensitive interpretation during the training. A one day familiarization session was provided on peer supervision and covered the supervision framework with practice and feedback by the principal researcher. Supervision was based on Egan's (2014) skilled helping model comprising educative, (what do I need to know about trauma and the TRT program), restorative (reflecting on feelings), and normative elements (holding to program protocols and adaptations within theoretical guidelines). Counselors met monthly in pairs and small groups for supervision to prepare and reflect on lesson delivery.

Figure 1: Participant flow chart**Measures**

The Exposure to War Stressors Questionnaire (EWSQ: Smith, Perrin, Yule, Hacam, &

Stuvland, 2002) was used to measure the number and type of stressor experienced by participants, what stressors occurred during program delivery and whether there was any difference between TRT and Wait List in stressor exposure. Stressors were also examined in terms of age, gender, and school type. Participants selected Yes or No to indicate their experience of 26 possible traumatic war events. Total scores ranged from 0 to 26 with no clinical cut-off. The reliability of the Arabic version of the EWSQ is high with a Cronbach alpha coefficient of .94. The CRIES-13 measures the symptoms of intrusion, avoidance, and arousal (13 items on a 4 point scale – not at all, rarely, sometimes, often) with a Cronbach alpha coefficient of .80 showing good internal consistency (Smith, Perrin, Dyregrov, & Yule, 2003). A cut-off of 17 or more (indicating the probability of PTSD) on the intrusion/avoidance sub-scales (eight items) was used for screening PTSD and for assessing PTSD at post-test. The Depression Self-rating Scale (DSRS: Birleson, 1981) measures the extent of children's depressive symptoms (18 items on a three point scale – most, sometimes, never). A cut-off of 15 or more indicating the probability of a depressive disorder was used (Birleson, Hudson, Grey-Buchanan, & Wolff, 1987). A range of moderate to high internal consistency has been found across a number of child and adolescent studies (Ivarsson, Gillberg, Arvidsson, & Broberg, 2002).

The Adolescent Dissociative Experiences Scale (ADES) measures the symptoms of dissociation as experienced and reported by adolescents. It was selected because of its exceptionally high reliability score (Cronbach's alpha = 0.93). A clinical cut off of four or more indicates the probability of a clinical diagnosis of dissociation. The ADES was translated into Arabic by one experienced Palestinian interpreter, then blind back-translated (Bracken & Barona, 1991) into English by another followed by a check by the two translators on the final Arabic version. The reliability of the battery of translated measures into Arabic was high with

Cronbach alpha coefficients as follows: EWSQ (.94); CRIES-13 (.93); DSRS (.84) and the ADES (.91). All measures' reliability was at satisfactory levels.

Program fidelity

Program fidelity was measured through presenter self-report and observer report of program delivery. This method has been used previously in the evaluation of TRT (Barron, et al., 2013). A form listing the protocols for program structure, content, script adherence, and extent of program adaptation was provided. The form was completed independently at the end of each session by the presenter and the observing counselor. Responses were totaled and are presented as percentages.

Calculated costs

In an aid dependent context, assessment of cost enables local NGOs to communicate to funders what works, what they want to develop, and how much this costs. In order to assess future TRT delivery and evaluation, analysis of costs were calculated for 10 counselors and two local, rather than international trainers delivering TRT within their own geographical location. Costs were calculated at the completion of the program by the principle and field researcher and checked against the budget proposal. Actual costs/rates were used for analysis. Costs included peer supervision time; screening/evaluation material and delivery of CRIES-8; costs of program materials and packs; stipends for trainers and counselors; participant lunches/coffee/water and travel costs during training. Cost was calculated per student, per school, and for students who no longer met the criteria for posttraumatic stress.

Quantitative data analysis

Omnibus Multivariate analyzes were conducted on all standardized measures and subscales. Moderating effects analyzed were: age group, gender, school type, and TRT delivery

group. Effect sizes were calculated using Cohen's d between intervention and Wait List for PTSD, depression, and dissociation. Because of the size of gain achieved, a within group (intervention) effect size was calculated for PTSD. Following analysis of intervention and Wait List data from participants who completed the TRT and pre and post-test measures ($n = 139$), an intention to treat analysis (ITT) was conducted on all participants in both conditions, where at least pre-test data was available ($n = 154$: 79 TRT and $n = 75$ Wait List). A conservative estimate of treatment was used where participant pre-test scores were also used as post-test scores (Gupta, 2011). An ITT effect size analysis was then conducted on PTSD, depression, and dissociation between intervention and Wait List.

Procedure

University of Dundee Research Ethics Committee (UREC) approval was obtained prior to the study being conducted. Active informed consent was required by parents/caregivers, school counselors, schools, and the Palestinian Authority Ministry of Education, and active informed assent was obtained from adolescents. Screening for PTSD was conducted one month prior to program delivery. School counselors randomly allocated adolescents to TRT and Wait List by tossing a coin for each participant. All other pre-intervention measures were delivered two weeks prior to the program. All post-test questionnaires were delivered two weeks following program delivery.

Results

Attrition at post-test included 15 students, four from the intervention group and 11 from the Wait List. The sample for analysis was $n = 139$ with $n = 75$ in the intervention and $n = 64$ in the Wait List. There were four year groups: 11-12yrs ($n = 6$ intervention, $n = 10$ Wait List); 12-13yrs ($n = 28$; $n = 25$); 13-14yrs ($n = 32$; $n = 24$); 14-15yrs ($n = 9$, $n = 5$). The average age in the

intervention was 13.6 years ($SD = .82$) compared to 13.4 years ($SD = .83$) in the Wait List. There were 56 males and 83 females: intervention ($n = 27m, n = 48f$) and Wait List ($n = 29m, 35f$).

Adolescents were from three types of secondary school (11-18years): public male schools provided by the Palestinian Authority ($n = 21$ intervention, $n = 21$ Wait List); public female schools provided by the Palestinian Authority ($n = 42; n = 28$ Wait List); and private mixed sex schools provided by international non-governmental agencies ($n = 12; n = 15$). The average number of adolescents in a TRT group over five sessions was eight, ranging from 7 to 11.

Exposure to war stressors

High levels of war stressor exposure were found per adolescent, ranging from 9 to 26 events. This included 16 adolescents who each experienced 24 types of stressors. The five most frequently reported stressors in intervention and Wait List groups were: Q10 'parents separated from each other' ($n = 133, 97.1\%$); Q25 'used as a human shield' ($n = 133, 96.4\%$); Q16 'separated from family' ($n = 131, 95.6\%$); Q11 'shot at by snipers' ($n = 130, 94.2\%$); and Q12 'a member of the family killed' ($n = 129, 94.2\%$). The least reported stressors were Q26 'seeing someone raped' ($n = 47, 34.6\%$); Q8 'family member injured' ($n = 49, 36.6\%$); and Q19 'seeing someone tortured' ($n = 52, 38.5\%$). War stressor exposure was similar between TRT and Waitlist at pre-intervention $F(1,136) = 0.151, p = .669$ with the average number of stressors ($18.90, SD = 4.42$ and $18.80, SD = 4.05$) respectively.

No significant difference was found at post-test $F(1,134) = 0.041, p = .840$ between intervention and Wait List groups, however means increased for both conditions ($19.61, SD = 3.43; 19.44, SD = 3.67$) respectively. Small increases in frequency were identified for 14 different stressors pre to post-test with equivalent numbers across intervention ($n = 14$) and Wait List ($n = 12$). The largest increases in frequency reported in the intervention were for Q14

‘seeing a dead body’ ($n = 10$); Q2 ‘staying in basement during shelling’ ($n = 10$); and Q9 ‘home shelled’ ($n = 7$). In the Wait List, the largest frequency increases were for Q8 ‘family member injured’ ($n = 2$); Q2 ‘staying in the basement during shelling’ ($n = 8$); and Q13 ‘armed person(s) forcibly entered home’ ($n = 6$). In short, new forms of violence occurred for 19% of adolescents during the delivery of TRT with equivalent numbers in intervention and Waitlist groups.

Age and exposure.

Age was not a factor in the number of war stressors experienced. No significant difference was found between intervention and Wait List groups at pre-intervention $F(1,139) = 0.130, p = .719$ and post-test $F(1,139) = 1.193, p = .277$ (18.47, $SD = 4.24$ - 19.42, $SD = 3.53$). Further, no difference was found between the four age groups for the intervention at pre-intervention $F(3,72) = 0.392, p = .759$ and at post-test $F(3,72) = 0.022, p = .995$. This was also the case for the Wait List $F(3,62) = 0.775, p = .524$ pre-intervention, and $F(3,62) = 0.708, p = .551$ post-test.

Gender and exposure.

In the intervention group, there was no gender difference for war stressor exposure at pre-intervention $F(1,72) = 2.237, p = .139$ and post-test $F(1,72) = 3.965, p = .050$. In the Wait List group, however, there was a significant gender difference at both pre-intervention $F(1,62) = 12.881, p < .01$, (16.96m, $SD = 3.99$ - 20.34f, $SD = 3.47$) and post-test $F(1,62) = 20.824, p < .01$, (17.39m, $SD = 3.52$ - 20.09f, $SD = 2.90$) with females experiencing higher levels of war stressor than males and similar levels of exposure pre and post intervention.

School type and exposure.

There was no significant difference for school type in the intervention group at pre-intervention $F(2,72) = 3.017, p = .055$ and post-test $F(2,72) = 1.536, p = .222$, whereas, a

significant difference was found in the Wait List at both pre-intervention $F(2,62) = 10.172, p = <.01$ and post-test $F(2,62) = 7.456, p = <.01$. Adolescents in the Wait List at pre-test in private school experienced less war stressors (16.41; $SD = 3.49$) than adolescents at public male (18.15; $SD = 4.47$) and public female schools (20.28; $SD = 3.84$). This difference was no longer evident at post-test $F(1,136) = 0.084, p = .773$ due to an increase in exposure for private school adolescents (19.33; $SD = 3.98$), compared to public male (18.05; $SD = 3.31$) and public female school exposure (20.51; $SD = 3.18$). Type of school therefore, appears to have been a transitory factor with less traumatic events occurring for Wait List adolescents in private schools at pre-intervention but by the end of TRT delivery, school type was no longer a factor.

In summary, adolescents experienced high levels of war stressors. There is evidence that violence continued during the delivery of TRT with new war stressors occurring for a fifth of the sample. While no age difference was found, some females were exposed to more war stressors than males. There appears to have been some variation in the types of school to war stressors but this was time limited.

Pre-intervention symptom levels

PTSD screening.

The number of adolescents identified as likely to be diagnosed with PTSD ($n = 154$) equated to 46.1% of the screened sample ($n = 334$). Levels of post-traumatic stress were similar in TRT and Wait List groups at pre-intervention $F(1,139) = 0.668, p = .415$ (see Table 1). Mean levels of post-traumatic-stress in intervention and Wait List were high (25.59, $SD = 7.08$ - 24.67, $SD = 5.53$). No significant difference was found between intervention and Wait List in the subtests of intrusion $F(1,139) = 0.074, p = .787$ (12.11, $SD = 4.62$ - 12.34, $SD = 3.65$) and avoidance $F(1,139) = 3.133, p = .079$ (13.23, $SD = 4.07$ - $SD = 4.08$). Further, no significant

differences in post-traumatic stress were found between conditions for the moderating factors of age $F(1,139) = 0.114, p = .736$, gender $F(1,139) = 0.184, p = .669$, school type $F(1,139) = 0.000, p = .997$, and delivery group $F(1,139) = 0.792, p = .375$.

Depression.

Depression was similar at pre-intervention between intervention and Wait List $F(1,137) = 2.437, p = .121$ (16.30, $SD = 4.97$ - 14.71, $SD = 4.30$). Of the 139 participants, $n = 74$ (53.2%) met the cut-off indicating likelihood of a depressive diagnosis. This equated to 22.2% in the corpus sample. Gender was the only significant factor at pre-intervention $F(1,137) = 4.221, p < .05$ with a slightly higher level of depression in females in the intervention (17.10f, $SD = 4.96$ - 14.89m, $SD = 4.77$) and Wait List groups (15.17f, $SD = 4.83$ - 14.17, $SD = 3.57$). For the total sample means were 16.29f, $SD = 4.98$ - 14.52m, $SD = 4.17$. This may be partly related to increased exposure to war stressors for females. No significant differences were found between conditions for the moderating factors of age $F(1,137) = 0.207, p = .650$, school type $F(1,137) = 0.806, p = .371$ and delivery group $F(1,137) = 0.883, p = .349$.

Dissociation.

Intervention and Wait List were similar at pre-intervention $F(1,134) = 1.000, p = .753$. (3.98, $SD = 1.95$ - 4.09, $SD = 2.32$). Subtest scores were also similar between conditions: dissociative amnesia $F(134) = 0.282, p = .254$; absorption $F(134) = 0.149, p = .701$, depersonalization/derealisation $F(134) = 0.006, p = .938$, and passive influence $F(134) = 0.407, p = .525$. Levels of dissociation in the sample were $n = 68$ (48.9%). This equates to 20.4% of the corpus sample. No significant differences were found between intervention and Wait List for the moderating factors of age $F(1,134) = 1.577, p = .211$, gender $F(1,134) = 2.901, p = .091$, school type $F(1,134) = 0.015, p = .902$, and delivery group $F(1,134) = 0.198, p = .657$. A gender

difference was found on the amnesia subtest $F(1,134) = 8.431, p < .01$ where females showed slightly lower levels of dissociative amnesia in intervention (3.90f, $SD = 2.26 - 4.61$ m, $SD = 2.02$) and Wait List (3.61f, $SD = 2.40 - 5.51$ m, $SD = 2.05$). Again this may be linked to higher exposure levels. Dissociation levels were equivalent to levels of depression.

Table 1

PTSD, Depression and Dissociation: Comparison between TRT and Wait List - means, standard deviation, significance and effect size

Symptom	Condition	Means (<i>SD</i>)		Significance	Effect size / ITT
		Pre	Post		
PTSD	TRT	25.59 (7.08)	18.57. (8.80)	$F(1,139) = 12.537, p < .01^*$	$d = 0.66 / 0.67$
	WL	24.67 (5.53)	24.16 (8.04)		
Depression	TRT	16.30 (4.97)	16.16 (5.68)	$F(1,139) = 0.106, p = .746$	$d = 0.01 / 0.00$
	WL	14.71 (4.30)	16.23 (5.54)		
Dissociation	TRT	3.98 (1.95)	3.94 (2.01)	$F(1,134) = 2.118, p = .134$	$d = 0.27 / 0.21$
	WL	4.10 (2.32)	4.53 (2.40)		

*significant result

Post-test symptom levels

Post-traumatic stress.

Following TRT, a significant difference was found in post-traumatic stress between intervention and Wait List, $F(1,139) = 12.537, p < .01$ (28.63, $SD = 11.94 - 18.57$, $SD = 8.80$).

In the intervention group, $n = 29$ (41%) of young people no longer fit the criteria for PTSD. This

compared with only $n = 9$ (13%) in the Waitlist who no longer met the criteria. Significant differences were also found for intervention compared to Wait List for the subtests of intrusion $F(1,139) = 13.704, p < .01$ (12.11, $SD = 4.62$ - 7.68, $SD = 5.24$ intervention vs. 12.34, $SD = 3.65$ - 10.94, $SD = 5.29$ Wait List) and avoidance $F(1,138) = 4.229, p < .01$ (13.23, $SD = 4.08$ - 10.89, $SD = 5.71$ intervention vs. 12.00, $SD = 4.03$ - 13.06, $SD = 4.91$). A trend was also found for the arousal subtest $F(1,139) = 3.531, p = .062$ (9.89, $SD = 5.91$ - 11.59, $SD = 5.81$).

A close to large effect size was found for PTSD ($d = 0.66$; 0.67 ITT) between intervention and Wait List. In terms of subtests, Intrusion ($d = 0.62$) was also close to a large effect size; Avoidance, a medium effect size ($d = 0.41$) and Arousal, a small effect size ($d = 0.29$). Despite the evidence of ongoing and increasing types of violence, TRT achieved a 59% drop in adolescents meeting the criteria for PTSD. This equated to a large 'within' group effect size $d = 0.88$. Spontaneous recovery for a small number of Wait List adolescents suggests a remarkable degree of resilience for some.

Depression.

No significant difference was found in depression between intervention and Wait List groups at post-test $F(1,139) = 0.106, p = .746$. There was, however, an increase in Wait List (14.71, $SD = 4.30$ - 16.23, $SD = 5.54$) that was not evident in the intervention (16.31, $SD = 4.97$ - 16.16, $SD = 5.68$). No significant differences were found, between intervention and Wait List, for age $F(1,139) = 0.026, p = .873$ and school type $F(1,138) = 2.247, p = .136$. A significant result was, however, found between intervention and Wait List for gender $F(1,139) = 8.699, p < .01$, where there was an increase in female depression in the Wait List (15.17f, $SD = 4.83$ - 16.80f, $SD = 5.98$) that was not evident in the intervention (17.10f, $SD = 4.96$ - 17.39f, $SD = 5.97$). There was no difference in male depression between intervention (14.89m, $SD = 4.77$ -

14.97m, $SD = 4.54$) and Wait List (14.52, $SD = 4.17 - 14.84$, $SD = 4.79$). A trend towards significance between intervention and Wait List was also identified for delivery group $F(1,139) = 3.247$, $p = .074$. Again there was a slight increase in depression in the Wait List 14.72 ($SD = 2.30$) – 16.26 ($SD = 5.55$) compared to intervention 16.31 ($SD = 4.77$) – 16.16 ($SD = 5.68$).

Dissociation.

No significant difference was found between intervention (3.98, $SD = 1.95 - 3.94$, $SD = 2.01$) and Wait List groups (4.10, $SD = 2.32 - 4.35$, $SD = 2.40$) for dissociation post-test $F(1,134) = 2.118$, $p = .134$. There was no change between intervention and Wait List groups for age $F(1,134) = 3.000$, $p = .086$, gender $F(1,134) = 0.085$, $p = .771$, school type $F(1,134) = 0.953$, $p = .331$, and delivery group $F(1,134) = 0.380$, $p = .539$. Absorption was the only subtest with a trend towards significance between intervention and Wait List at post-test. $F(1,134) = 2.928$, $p = .090$ with an increase in the Wait List from pre to post-test (4.37, $SD = 2.57 - 4.81$, $SD = 2.23$) compared to a small mean reduction in the intervention (4.20, $SD = 2.06 - 4.16$, $SD = 2.04$). It appears TRT had little impact on dissociation although there may have been a protective factor given there was no increase in dissociation in the intervention group. This is perhaps not a surprising finding as dissociation is not specifically targeted within TRT.

Program fidelity

Counselors reported 96% of objectives were achieved and 81% of guidelines were followed. In contrast, observers reported 74% and 75% respectively. Counselors and observers were similar in their rating of presentation skills: quality of interactions (79% and 76% respectively); enthusiasm (82% and 77%); time on task (80 and 76%); and time activities focused on outcomes (81% and 79%). The length of time sessions adapted was 21% and 25% and mostly fit theoretical guidelines (85% and 78%). A high level of protocol adherence was

reported by presenters, whereas observers' ratings question the extent to which this was achieved. Presenter and observer ratings were similar, however, in the nature and extent of program adaptation.

Cost analysis

Training for 10 counselors delivering the program to 10 adolescents was calculated as follows: TRT counselor material packs 10 at \$26.83 = \$268.30; counselor stipends 10 at \$69.82 = \$698.20; trainer stipend (local) 2 at \$69.82 x 3 days = \$418.92; supervision 10 at \$15.52 x 3 one hour sessions = \$465.60; participant lunches/coffee/water 10 at \$31.03 x 3 days = \$930.90; participant travel 10 at \$15.52 x 3 days = \$465.60;; screening material for children 300 x \$1.55 = \$465; and evaluation material 100 x \$1.55 = \$155; Total cost equaled \$3867.52. Cost per adolescent was \$38.68. When the cost per adolescent was multiplied by the number of adolescents whose symptoms reduced below clinically significant levels ($n = 29$; 41%), this equated to \$1121.52. The cost per school is \$3867.52 divided by five (two counselors per school) equals \$773.50 per school. These costs are relatively small for (i) statistically significant clinical gains in posttraumatic stress, particularly for 29 adolescents and (ii) a potential protective factor for depression and dissociation.

Discussion

The main findings of the current study indicate that TRT led to a substantial reduction in the number of adolescents ($n = 29$, 41%), in rural villages along the separation wall, who were at clinically significant levels indicative of PTSD. This is the second study that has identified a large effect size for TRT in the West Bank; the other was in the city of Nablus, in the north of occupied Palestine, where there had been high levels of ongoing military violence (Barron et al.,

2013). Teaching Recovery Techniques therefore appears to be equally effective both in city and rural contexts in the West Bank. Gaza, however, may be a different context. As mentioned earlier, Quota and colleagues (2012) reported a small effect size for TRT with post-traumatic stress, however, delivery was following a recent bombardment where children and adolescents continued to feel unsafe. Further, the cluster RCT, may have underestimated program impact, due to the large units of analysis (area rather than individual). It is therefore difficult to know whether the differing results were due to context or research methodology. In the current study, TRT also appears to have provided a protective factor for depression and dissociation despite ongoing military violence. Lower attrition levels suggest TRT may help in maintaining adolescent involvement.

In terms of trauma exposure, adolescents in villages along the separation wall reported higher levels of war stressors ($n = 19$ on average) than in Nablus ($n = 13$). Not surprisingly then, the extent and nature of war stressors appear to be related to the differing levels of military activity in different geographical areas (Oudeh et al., 2015). During delivery of TRT, a fifth of adolescents reported new war stressors highlighting ongoing military violence in these villages. There was no indication, however, that war stressor exposure differed according to age. This has a surface validity to it as military violence is often targeted at whole communities in occupied Palestine. The current study found mixed results for gender with increased exposure for some females. Other studies also indicate mixed findings, i.e. no gender difference in pre-school children (Thabet, Karim and Vostanis, 2006), males more at risk in Gaza (Altawil, Nel, Asker, Samara, & Harrold, 2008) and females more at risk beyond Palestine (Kaminer, Seedat, Lockhat, & Stein, 2000). Further research is therefore needed into gender and war stressor exposure. The difference found between types of school and war stressor was time limited. It would therefore

seem, villages along the separation wall are, over a relatively short period of time, equally at risk of military violence.

In terms of screening for resultant symptoms, 46 percent of adolescents in the general population reported clinically significant levels of posttraumatic stress, a higher level than reported in previous studies. Age, gender, and school type did not appear to influence the extent and nature of PTSD symptoms. Half the sample also reported depression. This equates to a fifth of the general adolescent population. This is a cautious estimate as this was a sample specifically screened for PTSD. In contrast, the extent of depression in Nablus was higher, around 80% (Barron et al., 2013). Such a wide range of self-reporting requires further research. Females reported slightly higher levels of depression, however, this may be related to the increased exposure to war stressors for some females. Half the adolescents in this study also reported dissociation, again equating to a fifth of the general population. This is double the amount of dissociation found in the Gazan study (Quota et al., 2012). The comparison is a tentative one, as studies use different samples, types of dissociation, and measures. Indications are, however, that depression and dissociation co-occur with PTSD for adolescents in villages and cities in the West Bank.

Program fidelity, as measured by self and observer reported ratings, was higher than in the previous study (Barron et al., 2013). This may be a result of the increased supervision provided. These rates give confidence that protocols were followed and that TRT as prescribed was delivered. Finally, the cost of TRT was relatively low. Running costs, once counselors are trained, are minimal as counselors are on site to deliver TRT during the school day. Low costs are an important consideration for a United Nations (UN) recognized state that is dependent on global financial Aid.

Limitations

The study had a relatively small sample size limiting generalization. Only child self-reports were used for symptoms and it is therefore possible there are unknown participant bias effects. Results for PTSD, however, were similar to the Nablus study, where adult reports confirmed adolescent responses. Future studies, however, need to include parental and teachers' questions as a comparison. There was no qualitative exploration of adolescent experience of either the program or the process of research. This may have provided rich insights into adolescent experience and gains. Further, no evaluation was conducted on the effectiveness of the different component parts of the program. Ministry of Education contact following random selection may have influenced some counselors to remain in the study. It is uncertain how this impacted counselor motivation. Program fidelity, as measured by self and other-report, as opposed to video material, limits the analysis of protocol adherence and adaptation, and the lack of objective data from other sources raises questions about validity. Counselors, however, asked not to be videotaped as they were concerned about surveillance by the State of Israel. The measure of cost in this study was preliminary. A more sophisticated cost-benefit analysis would provide local NGOs, policy makers, and global funders with more detailed information. It is important to recognize, however, that for many in Palestine, the primary need is for food, water, and housing. Finally, where adolescents and counselors thought appropriate, students continued to receive individualized support to cope with the symptoms of depression and dissociation.

Conclusion

Teaching Recovery Techniques appears to be effective in reducing adolescents' PTSD in rural locations in high conflict areas along the separation wall. There is little evidence, however, that TRT reduces symptoms of depression and dissociation, although TRT appears to provide a

protective factor in maintaining symptom levels during ongoing military violence. This needs further study. From a global funding perspective, the cost of TRT school-based delivery is relatively low, however, further research is needed to explore the impact of ongoing traumatization over time. Along with the findings of the Nablus study, it is recommended that TRT be delivered in West Bank city and village schools for adolescents with PTSD.

Recommendations for research

Future studies need to explore TRT program delivery to the universal school population to assess whether TRT has the potential to prevent traumatization in children from future traumatic events. Studies need to evaluate the impact of TRT on pre-adolescents; however, this would require program adaptation for a younger population. There is a need to assess the extent of dissociation in the whole child population and explore how adolescent dissociation in Palestine mediates future pathology. This may help towards informing the nature of appropriate treatment. Program evaluation needs to be longitudinal and explore the long term needs of adolescents living under ongoing subjugation and traumatization. Evaluation also needs to clarify which parts of the program are most impactful and over how many sessions. The application of a more robust cost-benefit measure would be helpful for policy makers and funders. Finally, there is a need to assess adolescent cultural response to research and how language, culture, and the role of research impact adolescent participants.

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